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The Effect of the Reforms to Compulsion on Annuity Demand

By

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Abstract This paper investigates the effect of recent regulatory changes to the compulsory annuitisation of tax-privileged pension savings, on the demand for annuities and other retirement products. We find that the demand for annuities has fallen by almost seventy-five percent from its peak in 2012, and the demand for income drawdown products has increased. There is some evidence that people at younger ages and with smaller pension pots are choosing not to annuitise, and hence the average size of an annuity purchase has increased.

Keywords: Insurance markets, annuities, drawdown

JEL codes: G22, D4, D82

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I. Introduction

Until 2011 it was effectively compulsory for most individuals in the UK with a defined-contribution (DC) pension to buy an annuity in retirement. This annuitisation requirement, in place since 1956, was removed in two separate stages and in this paper we use data provided by the Association of British Insurers (ABI) to analyse the effects on annuity sales of both policy changes.

Both the Conservative and Liberal Democrat election manifestos had proposed changing the annuity requirement and the Coalition's June 2010 Budget announced a consultation on how to implement the change. The removal of the requirement to annuitise, subject to a minimum income requirement (MIR) of a minimum total pension income of £20,000, was announced in the March 2011 Budget and came into effect in April 2011. Despite this relaxation of the annuitisation requirement, the presence of the MIR meant that most individuals continued to have little option other than buy an annuity or do nothing with their pension, since the alternative of income drawdown (a type of phased withdrawal) was considered suitable only for the wealthy (due to high costs).

The second change occurred in the March 2014 Budget, when the Chancellor of the Exchequer made the surprise announcement that the rules on accessing DC pensions would be much more flexible, declaring "no-one will have to buy an annuity". Although the policy only formally came into effect in April 2015, transitional arrangements and the existing ability to delay annuitisation meant that most pensioners were able to change their annuitisation decisions almost immediately.

Despite theoretical arguments that the welfare benefits of annuitisation are large (Yaari, 1965), voluntary annuitisation is rare and many pensioners hold a high proportion of their wealth in non-annuitised form, a phenomenon known as the "annuity puzzle" (Brown, 2001): consequently annuity markets tend to be large only when annuitisation is compulsory. Inkmann, Lopes and Michaelides (2011) examine the determinants of voluntary annuity demand in the UK, using a

sample of 5,233 retired persons from English Longitudinal Study of Ageing (ELSA) panel dataset for two waves: 2002/3 and 2004/05. They find that only 4% of the initial sample voluntarily purchased annuities (5.9% in 04/05), which is confirmation of an annuity puzzle in the UK.

Cannon and Tonks (2008) explain that the annuity puzzle could be due to a range of factors. Although low annuity rates could potentially explain low demand, Cannon and Tonks (2011) and Cannon and Tonks (2013) demonstrate that money's worth values are high in both the voluntary and compulsory annuity markets, and the utility value of insurance exceeds any load factors or transaction costs. Alternative explanations for avoiding annuitisation include: bequest motives; health and long-term care costs in old-age; the existence of pre-annuitised wealth via the state pension; the effect of means-tested benefits; the option value of deferral of annuitisation to later ages; selection effects; and alternative optimal decumulation strategies.

Despite the likely importance of these factors, there remain unanswered questions about annuitisation in the UK compulsory market. Within this market, pensioners who strongly desired to avoid annuitisation could defer annuitisation until 75 and although deferring annuitisation would not address all of the issues listed in the previous paragraph, as we shall see, it is surprising that virtually no pensioners chose this option. One possible explanation for this is that the annuity puzzle is partly due to behavioural reasons, i.e., behaviour is influenced by psychological biases such as framing effects.¹

If framing effects are important the effect of removing compulsion from an annuity market is ambiguous, since agents may anchor their behaviour to

¹ Agnew, Anderson, Gerlach and Szykman (2008) report on an experimental investigation into the role of framing with respect to the annuitisation decision. FCA (2014) reports a similar framing experiment, and found that there was something about the word 'annuity' that deterred purchases despite the same people wanting longevity insurance. It appears that the product, or at least the word, is unpopular.

previous expectations. Furthermore, because compulsion in the UK has resulted in a large market, there are a much wider range of annuity products than can be found in other countries, such as enhanced annuities for pensioners with poor health. Hitherto the only annuity market to have a major change in policy is in Australia, where the removal of incentives to annuitise led to the annuity market virtually disappearing (Bateman and Piggott, 2011). Although the correlation between compulsion and high annuitisation rates is almost certainly causal, the UK policy changes provide an opportunity both to test this and to see the magnitude of the effect of removing compulsion on a large and mature annuity market.

The UK was unusual in having a policy of compulsory annuitisation, and various international commentators had commented on the benefits relative to the costs of this policy (Poterba, 2001; Yermo, 2001). Arguments in support of compulsory annuitisation are that it protects the state against moral hazard and individuals against myopia; it reduces (adverse) selection problems ensuring a large efficient market; and it reflects the tax advantages given to pension savings during the accumulation phase of a pension. There is also a tendency for compulsory annuitisation to redistribute wealth away from the poor (short-livers) to the rich (long-livers), although the presence of an enhanced annuity market for pensioners with ill health allows short-livers to separate themselves from the long-livers.

The Financial Conduct Authority (FCA, 2016) has undertaken an initial investigation into the effect of the 2015 changes on the market for retirement products. From a survey of 95 pension providers between July to September 2015 they report that 178,990 pensions have been accessed by consumers either taking an income or fully withdraw their money as cash. Of these, 34% used a cash lump sum, 30% used income drawdown, 13% purchased an annuity and 23% were small pot full withdrawals.

The next section describes the UK annuity market and details the policy changes of 2010/11 and 2014/15. Section III provides a list of research questions, and the data provided by the ABI are described in Section IV. We report our findings in Section V, and the final section provides some initial conclusions, and outlines future research questions.

II. Institutional Background and the Recent Reforms

Despite slight modifications in details, from 1956 the general principle of UK pension policy was that pension wealth accumulated in a personal pension should be annuitised at retirement. A consequence of this is that the UK has two separate annuity markets: the lifetime annuity market, until 2014 commonly known as the compulsory purchase annuity (CPA) market, where individuals who had accumulated a defined contribution pension fund through tax-advantaged contributions were required to convert their pension fund into an annuity (less a 25% tax-free lump sum); and a voluntary annuity market (purchased-life annuity, PLA) where individuals can convert any savings into a life annuity. The income streams in these two markets are taxed differently, with income in the CPA market being taxed at marginal rates (on the basis that these savings had previously benefited from tax deductibility on contributions and no tax on re-invested savings²), but annuity income in the PLA benefits from no tax on the run down in capital.

Even before the policy changes of 2010/11 and 2014/15, there were a variety of exceptions to the annuitisation requirement. As already noted, it was possible to take 25% of pension wealth as a tax-free lump sum: furthermore annuitisation could be deferred until age 75. It was also possible to avoid annuitisation if an individual personal pension fund was sufficiently small (the “small pots”

² Surveying different countries’ pension systems, Dilnot and Johnson (1994) and Antolín, Pugh and Stewart (2008) show that this exempt-exempt-taxed (EET) model is the most common tax system

exemption) or total pension wealth was sufficiently small (“trivial commutation”).³

Income drawdown (or “unsecured income”) has been allowed as an alternative to annuitisation since 1994, although the Financial Services Authority recommended these products only for individuals with relatively large pension pots.⁴ Until 2011, each year a pensioner in drawdown could withdraw a proportion of their funds up to a limit set by the Government, designed to mirror annuity rates (120% of the ‘relevant annuity’ or ‘GAD rate’ (provided by the Government Actuary’s Department tables). At 75 the pensioner had to switch to an annuity (“secured income”) or “alternatively secured income” of up to 90% of the GAD rates. On death before 75, remaining funds could be repaid as a capital sum, subject to tax of 35 per cent, or transferred to a pension for a dependant.

The major component of the 2010/11 reforms was to remove the compulsory annuitisation requirements for those individuals who could demonstrate that they had sufficient pension income to satisfy the minimum income requirement of £20,000 per annum (Blake, Cannon and Tonks, 2010): the precise definition of what counted as income and the precise minimum were only announced in April 2011. Other changes from April 2011 were the relaxation of the minimum level of withdrawals, making the maximum level of withdrawals the same for those above and below age 75, and an increase in the tax charge on the remaining capital sum on death.

³ Unless an individual suffered poor health, it was impossible to access pension wealth through annuitisation until age 50, rising to age 55 in 2012. We discuss this issue in the online appendix.

⁴ The FSA (2009) MoneyMadeClear Guidelines on income withdrawal and the FSA (2010) guide to pension annuities emphasised that “*Income withdrawal plans are complex and not suitable for everyone, for example if you have a small pension fund and no other assets or income to fall back on*” (April, 2010). Earlier versions of the FSA guides to pension annuities recommended that “*Income withdrawal involves extra costs and extra investment risk compared with buying an annuity straight away. For this reason, it is usually suitable only if you have a pension fund of over £100,000 (after taking any lump sum) or you have other assets and sources of income to fall back on*” (FSA, 2004).

An important distinction is made in the UK between “advice” (which can only be supplied by someone with appropriate qualifications and who bears some liability for failing to advise correctly) and “guidance”, which simply provides generic information. A key regulatory change emphasised in KPMG (2015) is the FSA’s Retail Distribution Review implemented in January 2013 which has meant that financial advice must be paid for by a fee agreed by the customer rather than commission paid by the provider, which has had the effect of financial advisors concentrating on the wealthier end of the consumer distribution. The implication is that individuals with small pension pots may be making decisions with insufficient information.

The Budget of 19 March 2014 included the surprise abolition of the annuitisation requirement (HM Treasury, 2014). These reforms to be enacted after 6th April 2015 had two components. First, individuals would be able to access their pension wealth as a cash withdrawal subject to marginal tax rates (which acts as a strong disincentive to withdraw all of the pension wealth as cash in one go) from the age of 55, along with fewer restrictions on annuities and no restrictions on income drawdown. Second, individuals would be entitled to free pension guidance.⁵

A third measure was the immediate introduction of a transitional regime for 2014/15, allowing more flexibility in income drawdown, and increasing the limits on trivial commutation and small pot payments respectively from £18,000 to £30,000, and £2,000 to £10,000 from 27th March 2014.⁶

⁵ In the appendix we provide some evidence of the effect of the 2014/15 change on the uptake of financial advice.

⁶ In addition these transitional arrangements: i) increased the maximum income allowed to be taken from drawdown from 120% to 150% of the rate set by the Government Actuary’s Department; and ii) decreased the Minimum Income Requirement from other sources to qualify for flexible drawdown from £20,000 to £12,000.

III. Research Questions and Hypotheses

Individuals with DC pension pots have a choice of four alternatives when deciding how to access their pension wealth: (i) purchase an annuity; (ii) set up an income drawdown scheme; (iii) withdraw some or all of the pension pot as cash and incur any tax consequences; or (iv) defer, and leave the pension pot invested. Our data allow us to measure the effect of both the 2010/11 and 2014/15 reforms on the sales of annuities and income drawdown products. In both cases we can observe changes in the number and value of contracts sold and hence the average size of annuity purchased. We would anticipate that the effect of the reforms will be for the demand for annuities to fall, both by total value and number of policies sold, but the extent of the fall will be an empirical question. Increased limits on trivial commutation and small pots rules, particularly during the transition period in 2014, are likely to affect the lower end of the annuity market more and so we also look at the distribution of annuity purchase sizes, anticipating that the average size of an annuity purchase will rise.

If some consumers had previously been using drawdown to escape annuitisation then the 2014 reforms should have reduced the demand for drawdown. On the other hand, these schemes have the advantage of offering the potential for growth of pension wealth, particularly when combined with expected increased future (health-related) costs; they allow for bequest motives; they provide flexibility, if individuals have not decided how to access their pension, or wish to defer annuitising. There also may be a temporary effect on drawdown caused by the needs of individuals to access a portion of their pension wealth during a transitional phase in which pension providers set up procedures for allowing savers to access their pension wealth.

We also examine the effect of the reforms on the age distribution of annuity sales. The major change in policy was the increase in the minimum pension age from 50 to 55 in April 2010, and the minimum age for trivial commutation / small pot

rules was reduced to 55 from 60 in April 2015. As a consequence of these changes we would expect to see more sensitivity to the reforms at younger ages.

We are also interested in examining the effect of the reforms on different types of annuity product. The UK has a significant market for “enhanced” annuities, offering better rates to individuals with poor health (and lower life expectancy) and it was predicted that the reforms would result in the collapse of the enhanced annuity market, since unhealthy individuals would prefer cash to an annuity.⁷

IV. Data

We have quarterly data on annuity and income drawdown sales by annuity providers who provide data returns to the ABI. These data are collected by the ABI from two quarterly surveys of insurance company sales, which are each then aggregated across annuity providers: the data cover virtually all of the annuity market and a large part of the drawdown market.⁸

The first dataset is the ABI’s Quarterly Long-Term Business (QLB) survey, which includes overall sales and values for a variety of products for 2007:Q1 - 2015:Q3. These are broken down into internal and external sales, with some information on annuity type and distribution channel. Over time the data collected has become more detailed which means that some of the most detailed breakdowns are not available before the policy changes that we wish to analyse. The other dataset is the ABI’s Quarterly Pension Annuity (QPA) survey, which includes sales broken down by age and fund size in different size bands for 2009:Q1 - 2015:Q3. As with the QLB data, further breakdowns of type of annuity have been

⁷ Although all life assurers suffered a negative share price reaction to the announcement of the abolition of compulsory annuitisation. Just Retirement plc and Partnership Assurance which specialised in enhanced annuities were particularly hard hit.

⁸ We do not have data on annuity rates. Since most providers price by postcode (to allow for geographical variations in life expectancy), collecting the full menu of prices across the UK is beyond the scope of this paper.

recorded in the most recent quarters, but are not available before the policy changes.

The QPA data are split by size of the annuity purchase and by age of the annuitant. These data also provide information on whether the annuity is purchased internally from the customer's existing pension provider or externally from a different annuity provider; furthermore we can identify sales of enhanced annuities, which offer better rates to individuals with poor health.

V. Results

We initially examine the effect of the policy changes on the annuity market as a whole. Figure 1, panel A, shows the growth in sales of annuities by value over the period up to 2013, and the subsequent decline. The decline in annuity sales immediately after the 2010 announcement was not large relative to the quarter-on-quarter fluctuation in sales. Annuity premiums peaked in the last quarter of 2012 with quarterly sales worth over £3.8 billion and declined dramatically since early 2014 following the announcement of the abolition of compulsion. By 2015, the value of quarterly annuity sales averaged about £1 billion, only a quarter of the peak in sales, two years earlier.

[INSERT Figure 1 here]

The figure also shows the value of income drawdown contracts, which in part mirrors the patterns in annuity sales. There was little obvious trend in total drawdown purchases up until 2014, but an increase since the most recent reforms, suggesting that some but not all individuals substituted drawdown for annuitisation.

[INSERT Table 1 here]

Table 1 quantifies the effect of the changes to the annuitisation rules illustrated in Figure 1: we report the average quarterly premiums, sales and mean purchase before the changes and then the effect of the changes in 2010/11 and 2014/15. To

do this we have to take a position on when to date the changes. We date the first change to 2011:Q2, since there were no transitional arrangements between 2010 and 2011 and it was not even clear what the policy would be until March 2011. We date the second policy change to 2014:Q2: although the policy change was only formally effected in 2015, the presence of transitional arrangements meant that annuitants could respond almost immediately. In each column the numbers are calculated by a simple regression of the form

$$(1) \quad x_t = \alpha + \beta_1 D_1 + \beta_2 D_2 + u_t$$

where x_t is the variable of interest; D_1 is a step dummy equal to zero up to 2011:Q1 and one from 2011:Q2 onwards; and analogously D_2 is a step dummy taking the value one from 2014:Q2 onwards. Given the small number of quarterly observations, we have not attempted a more fine-grained analysis of the changes.

For example, in column (3) the constant term shows that quarterly annuity premiums averaged £2.77 billion from 2007:Q1 to 2011:Q1, whereas column (4) shows that drawdown premiums averaged £576 million. Confirming that income drawdown was predominantly used by the wealthy, the average size of pension wealth converted into an annuity was £25,020, but for drawdown was £80,450 (columns 5 and 6).

The coefficients on the dummy variables quantify the changes illustrated in Figure 1: with annuity premiums fell by £1.8 billion, and drawdown sales more than doubling with an increase of £651 million. The effect of the 2011 reforms were relatively small with a fall in annuity sales of nearly fifteen thousand contracts per quarter, but an increase in annuity premiums of £308 million and a fall in drawdown contracts and premiums of £213 million.

Panel B of Figure 1 and columns (5) and (6) of Table 1 show that the average value of annuity contracts sold increased after 2011 and then again after 2014, with a small fall in the average size of drawdown products. To explore this further we

show the shares of annuity purchases of different sizes in Figure 2.⁹ The numbers of annuities purchased with premiums of up to £39,999 was declining gradually even before 2014, with purchases of other premium sizes approximately flat, but after 2014 there were substantial falls in annuity purchases of premium sizes up to £99,999, with the largest proportionate fall for the smallest purchases, as illustrated in Figure 2 by the log scale on the vertical axis. The number of annuity purchases with the largest premiums seems unaffected by the 2014/15 reforms, but the absolute numbers are tiny.

[INSERT Figure 2 here]

There has been a substantial drop in annuity purchases at the lower end of the market for small pension pots from 2010: yet the Minimum Income Requirement introduced in 2011 would have suggested that it was more likely to be the upper end of the size distribution that would have been affected by the 2010 changes. This may be explained by the ability to access pots of less than £2,000 from 2012, although, the evidence for this is not strong as the change was gradual. Other explanations may include greater awareness of the ability to consolidate pots and ease in doing so, an increase in the number of people with small pots leaving them untouched, or simply fund growth.

Table 2 reports the coefficients from regressions of the form in equation (1) where the explained variable is the logarithm of sales: we approximate the proportionate fall with $\exp\{\hat{\beta}\} - 1$.

[INSERT Table 2 here]

⁹ An individual may have more than one annuity contract, but we cannot observe that in our data.

The number of policies purchased for less than £5,000 fell by 32% after the 2011 change and a further 81% after the 2014 announcement, consistent with the increase in March 2014 the limits for trivial commutations and small pots.

[INSERT Figure 3 here]

Panel A in Figure 3 shows the distribution of number of annuity contracts by the age at which the annuitant annuitised their pension wealth before and after each set of changes. Even when annuitisation was compulsory, it was only ever compulsory to annuitise by age 75, yet the figure illustrates the slightly puzzling feature throughout the entire period of analysis that the vast majority of annuities were purchased at ages 60 and 65. This reflects three related trigger points for annuitisation: (i) the State Pension Age; ii) the default retirement age operated until recently by employers; and iii) most individuals' intended retirement date from their pension contract/scheme. These trigger points illustrate the importance of framing effects in annuity demand (Mitchell and Utkus, 2004).

Panel B of Figure 3 shows the number of annuity contracts purchased over time for the most important ages of 55, 60, 65, and 70. The relative number of annuities sold to 60-year olds and 65-year olds have changed in two significant ways: first, the number of annuity sales to 60-year olds has fallen proportionately by much more than annuity sales to 65-year olds (at the beginning of the period sales to the two ages were similar, but by the end of the period there were about twice as many sales to 65-year olds as to 60-year olds); second, the decline in annuity sales to 60-year olds started around the time of the 2010/11 change, during a period when annuity sales to 65-year olds were still rising. The continued high level of sales at 65 may be explained by individuals with guaranteed annuity rates in their pension contracts continuing to take advantage of them: these are often only available at the intended retirement date in the contract, and typically pay a much higher income than current market rates. The

number of sales to 55-year olds was affected by the increase in the minimum annuitisation age to 55 in 2010:Q2 (which we discuss further in the appendix).

Finally, we note that the 2014/15 changes seem to have attenuated the growth of the market for enhanced annuities: this had grown from about a tenth to a third of the whole market in the period up to 2014, but remained constant or fell slightly thereafter (details in the appendix).

VI. Conclusions

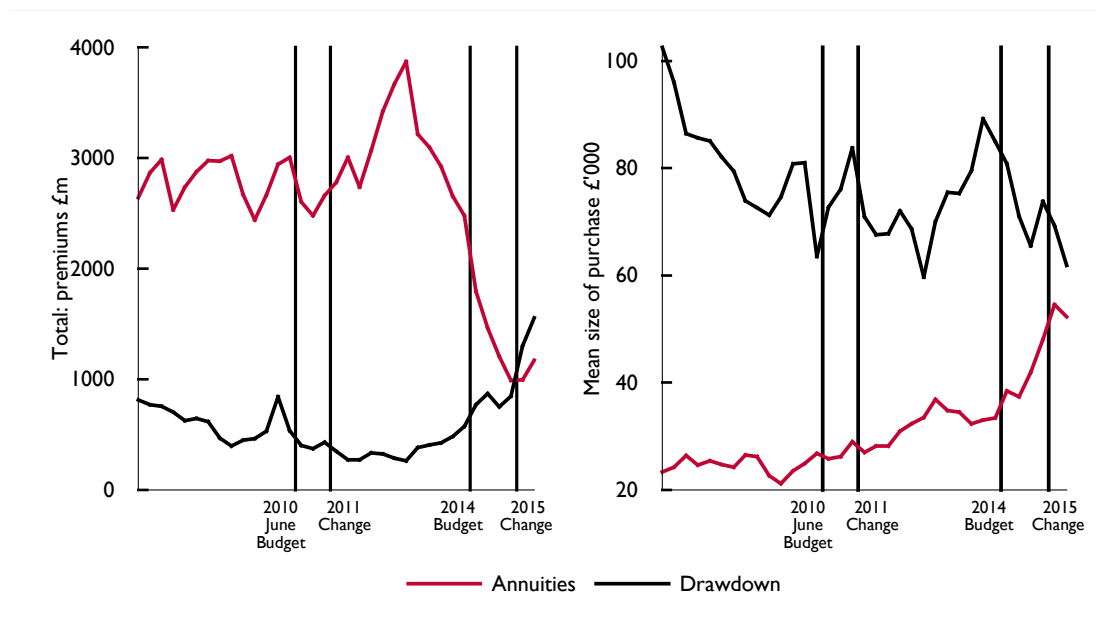
The reforms to the compulsory annuitisation requirements of DC funds in 2010/11 and especially 2014/15 have had a dramatic effect on the demand for annuities. The initial evidence is that the demand for annuities has fallen by seventy five percent from its peak in 2012. It appears that the average size of an annuity purchase has increased due to people at younger ages and with smaller pension pots choosing not to annuitise. The implication is that the reforms to the small pots rules, and raising the threshold on the commutation of pension wealth has had the most significant effect on the decline in annuitisation. The demand for income drawdown products has increased, and the average size of a drawdown contract has fallen, although it is unclear whether this is a temporary phenomenon, as individuals establish mechanisms for accessing their pension wealth.

There are trigger points at the ages at which individuals choose to access their pension wealth: with bunching of annuitisation at ages of 60 and 65. The reforms have not had a major impact on these trigger points. The market for enhanced annuities has declined along with all annuity sales, but the market share of enhanced annuities has remained roughly constant since the 2014/15 reforms. One of the intentions of these reforms was that the increased flexibility would act as an incentive to save for retirement. Future work will focus on the effect of the annuitisation reforms on the demand for DC pensions.

Figure 1: Total and Mean Value of Annuity and Drawdown Sales

Panel A

Panel B



Panel A shows the total value of annuity and income drawdown contracts sold (£millions) and Panel B shows the average size of annuity/drawdown purchases (£000s) in each quarter 2007 to 2015. The vertical lines in the figures identify the quarter in which the changes to annuitisation rules were announced, and the quarter in which these changes became effective. Data from QLB survey.

Figure 2: Distribution of Annuity Sales by Size of Annuity Purchase

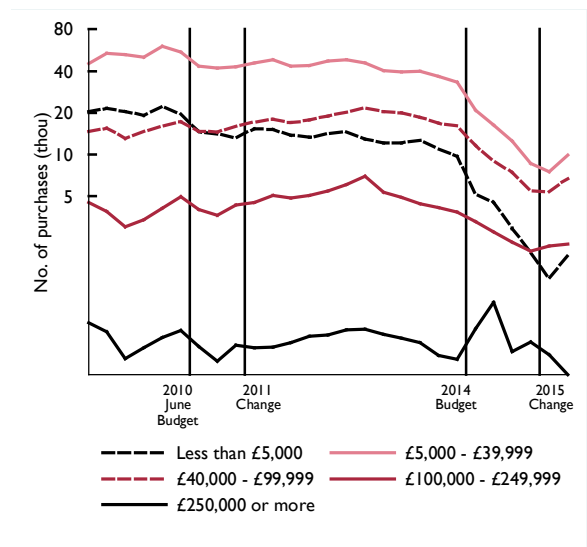
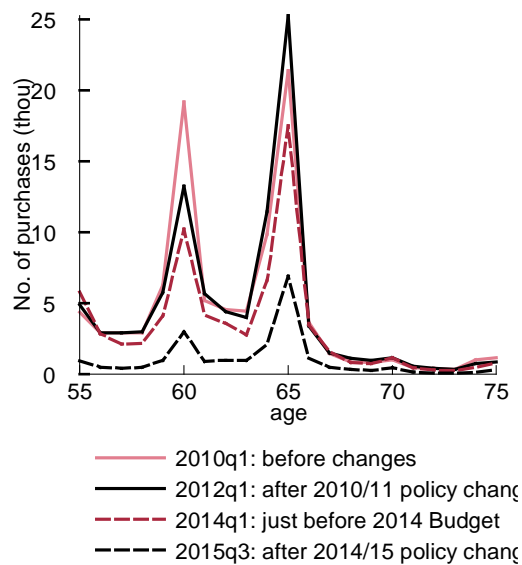


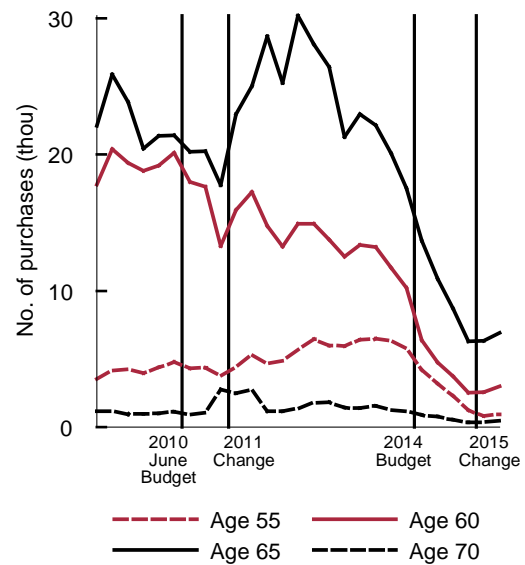
Figure shows quarterly annuity sales by the amount of the pension wealth being converted into an annuity: note the vertical logarithmic scale. Data from QPA survey.

Figure 3: Distribution of Annuity Sales by Age

Panel A



Panel B



Panel A shows distribution of number of annuity contracts (000s) by the age at which the annuitant annuitised their pension wealth, decomposed into four different time periods: pre-2010, 2010/2011, 2012/2013, 2014/2015. Panel B shows the number of annuity contract purchased over time for age cohorts: 55, 60, 65, and 70. Data from QPA survey.

Table 1: Changes in Sales of Pension Annuities and Drawdown

	Number of contracts (thou)		Total premiums (£m)		Average premium (£thou)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Annuities	Drawdown	Annuities	Drawdown	Annuities	Drawdown
Quarterly average, 2007.Q1 - 2011.Q1	111.04***	7.11***	2769.63***	576.36***	25.02***	80.45***
	(2.41)	(0.64)	(74.30)	(43.76)	(0.87)	(2.08)
Change in quarterly average after 2011:Q2	-14.86***	-2.22*	307.73*	-213.19**	7.06***	-7.00*
	(3.75)	(0.99)	(115.51)	(68.02)	(1.36)	(3.24)
Further change in quarterly average after 2014:Q2	-66.88***	9.87***	-1807.92***	651.21***	13.35***	-3.06
	(4.98)	(1.32)	(153.18)	(90.20)	(1.80)	(4.30)
<i>N</i>	35	35	35	35	35	35
<i>r</i> ²	0.90	0.64	0.82	0.62	0.82	0.20

Averages calculated from PBL database. Standard errors of the mean quarterly averages in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Nb Figure 1 shows that the reforms represented a structural change in the annuities and drawdown markets, and the use of previous data to construct standard errors is problematic.

Table 2: Changes in Sales of Pension Annuities by Size of Contract

	(1)	(2)	(3)	(4)	(5)
	< £5,000	£5,000 to £39,999	£40,000 to £99,999	£100,000 to £249,999	£250,000 and above
Policy change 2011:Q2	-.382 [*]	-.147	.201 ^{**}	.237 ^{**}	-.152
	(.137)	(.0925)	(.0685)	(.0718)	(.0893)
	-32%	-14%	22%	27%	-14%
Policy announcement 2014:Q2	-1.66 ^{***}	-1.28 ^{***}	-.928 ^{***}	-.716 ^{***}	-1.22 ^{***}
	(.155)	(.105)	(.0776)	(.0814)	(.101)
	-81%	-72%	-60%	-51%	-70%
Constant	10.6 ^{***}	10.8 ^{***}	9.62 ^{***}	8.28 ^{***}	11.6 ^{***}
	(.103)	(.0699)	(.0518)	(.0543)	(.0675)
<i>N</i>	27	27	27	27	27
<i>r</i> ²	.876	.89	.859	.763	.889

Dependent variable is the log of the number of policies purchased. Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ The figures in red approximately convert the regression coefficients to percentage falls ($= \exp(\text{betahat}) - 1$).

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